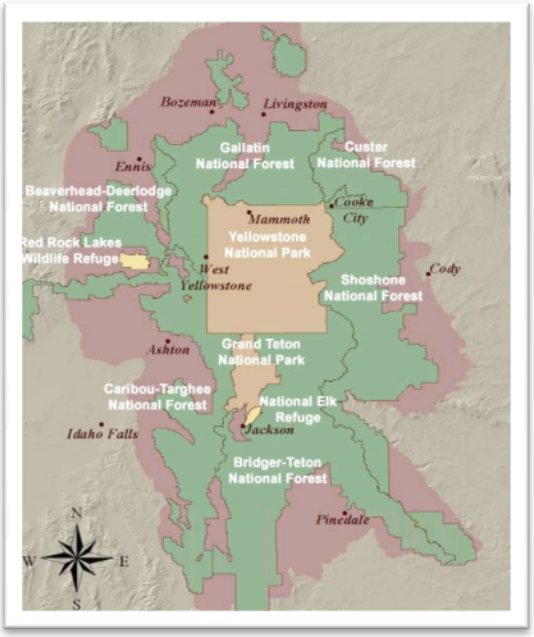
Clean Cities/National Park Partnership

Project Proposals for Yellowstone and Grand Teton National Parks

YELLOWSTONE-TETON
CLEAN ENERGY COALITION

Background

One of the few truly rural Clean Cities Coalitions, Yellowstone-Teton Clean Energy Coalition encompasses areas of western Wyoming, southwestern Montana, and Eastern Idaho. This area is also known as the Greater Yellowstone Ecosystem (GYE). The GYE encompasses more than 10 million acres (34,000 sq miles) and is the last intact, temperate ecosystem in the world. This ecosystem consists of two national parks, six National Forests, and two U.S. Fish and Wildlife sites.



This very diverse region boasts 13,000 ft alpine peaks, mountain deserts, includes the largest high elevation lake in North America, the highest concentration of geo-thermal features in the world, and is home to the complete array of animal species that were present in pre-historic times. Also permitted on these lands are three major ski resorts, a commercial airport, large concessioner operations, and dozens of tour guides and outfitters that provide visitor services.

Grand Teton and Yellowstone National Parks are Mandatory Class 1 Areas, as defined by the 1977 Clean Air Act. These areas are subject to anti-degradation practices to maintain their status and protect them from impairment created by manmade air pollution. Notably, the 2002 Clean Cities designation of the Yellowstone-Teton Clean Energy Coalition was the first and only ecosystem to receive such recognition.

Collectively, the GYE accommodates over **seven million visitors** annually. Yellowstone (YELL) and Grand Teton (GRTE) are at the heart of the Greater Yellowstone Ecosystem. According to the National Park Service Public Use Statistics Office the two parks combined last year for over 5.8 million visitors, accounting for nearly 10% of the 62 million total National Park visits in 2009. The high profile and high visitation of these two parks, along with their existing initiatives targeted to reduce their emissions footprints and petroleum consumption, make them ideal candidates for funding under this program.

Any well-marketed deployment of alternative fuels and advanced vehicle technologies in this region will receive extensive public exposure to the millions of annual visitors, residents, and business owners in the various 'gateway' cities adjacent to the parks. Tremendous potential exists for collaboration across the region to deploy a variety of alternative fuels and advanced technologies. These efforts will decrease regional

consumption of petroleum, improve air quality, and create a stronger, more diverse energy portfolio for the region while setting an example for the nation. The opportunity to successfully display these technologies in Yellowstone and Grand Teton National Parks will serve to further promote their use in the surrounding communities of Cody, Jackson, Dubois, West Yellowstone, Gardiner, Bozeman, Livingston, and beyond.

Working with both National Parks and several local stakeholders, Yellowstone-Teton Clean Energy Coalition (YTCEC) has identified three project areas for consideration by the Department of Energy (DOE) and National Park Service (NPS) for alternative fuel and advanced technology vehicle upgrades. Each of these projects has been identified as a meaningful, high visibility opportunity to reduce petroleum use and greenhouse gas emissions related to National Park Service operations, while introducing the public to alternative fuels and advanced vehicle technologies.

Lamar-Buffalo Ranch Hybrid Transit & Plug-in Utility Vehicle Project

The historic Lamar Buffalo Ranch was built in the early part of the century in an effort to increase the herd size of the few remaining bison in Yellowstone, preventing the feared extinction of the species. Buffalo ranching operations continued at Lamar until the 1950s. Today, the ranch has emerged as the premier educational facility within the park. The facility accommodates over 5,000 adults and children annually, providing classes on such subjects as geology, wolves, Yellowstone history, etc. The participants are also exposed to topics such as climate change, sustainability, and environmental stewardship.

Currently, the historic Lamar Buffalo Ranch/Yellowstone Institute has a well-defined educational program. The facility has been extremely successful in administering a myriad of educational programs that reach thousands of adults, as well as school age children. Additionally, the compound is located in one of the most pristine valleys in the park and enjoys year-round accessibility by vehicles. The facility is also used in the spring and fall for the Park Service's residential environmental education program, *Expedition: Yellowstone!*

This proposal is for the purchase of two hybrid shuttle vehicles, accommodating up to 25 passengers each depending on configurations, to provide more efficient transportation for field course participants staying at the ranch. Nearly all the courses offered at this facility include multiple, off-site field trips for wildlife viewing. Currently, the ranch operates vintage; diesel powered school buses that are extremely noisy, very polluting, and inefficient vehicles.

The current and future refueling opportunities will remain the same, as they are adequate. Refueling facilities for the two hybrid buses will be at the Tower Junction Government area. The dispensing pumps are located 15 miles from the ranch and have both E10 unleaded fuel, as well as B20 biodiesel. These pumps operate year round and

are integrated into the parks computerized fuel dispensing/tracking system. Yellowstone also has E85 blended unleaded fuel available in Mammoth Hot Springs, 28 miles from the ranch. The buses are routinely driven through the Mammoth Hot Springs area as part of their route, hence refueling would not be an added challenge.

Yellowstone National Park has the infrastructure and personnel to support the operation and maintenance of the proposed purchase of the two hybrid buses and electric utility vehicle. The NPS fleet operations division currently maintains 17 hybrid vehicles and 25 E85 vehicles. Mechanics have had specialized training in hybrid operations, battery maintenance, trouble shooting, etc.

The buses and the electric utility vehicle will be utilized year round on the only plowed road in the park. As a result, no seasonal storage of the vehicles will be required.

The experience of viewing wildlife and participating in educational programs in these vehicles is extremely diminished by these conditions. The vehicles would be electronically programmed to remain in the electric or silent mode when moving less than 10 miles an hour. This concept would ensure quality wildlife viewing while minimizing disturbance by noise and emissions.

The shuttles that are being requested are the Balance Hybrid Electric Vehicles, produced by Azure Dynamics. This vehicle is built on a Ford E-450 commercial stripped or cutaway chassis with a modified drive train and modified electronic controls system. These vehicles significantly reduce fuel consumption due to the following features:

- Engine stop/start capability
- Regenerative braking
- Electric-only mode at low speeds
- Electric launch-assist
- Availability as a hybrid-FFV, utilizing E85 ethanol instead of gasoline

The vehicle is powered by a traction motor in parallel with the conventional internal combustion engine and automatic transmission. The traction motor assists acceleration and captures energy during regenerative braking events. This energy is stored in the Energy Storage System (ESS). When the vehicle comes to a stop (e.g. at a red light), the engine will typically shut off in order to save fuel. When this happens, the Electric Power Assist System and DC/DC are enabled to maintain power steering, power brakes and 12 volt charging.

The vehicle also has an Integrated Starter Generator (ISG) mounted to the front of the engine, which is used to provide quick re-starts of the engine when accelerating from a stop. It also generates power to charge the ESS. The high voltage system is self-contained and it does not have to be plugged in to an external power source for charging.

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These vehicles would have maximum capacity every day, year round, servicing the facility's courses which are conducted 365 days a year. The Clean Cities and NPS sustainability message would be developed in course curriculum and communicated to each passenger stepping onto these hybrid vehicles.

As mentioned above, the ranch has emerged as the premier educational facility within the park. The facility accommodates over 5,000 adults and children annually and staff provides classes on such subjects as geology, wolves, Yellowstone history, etc. The participants are also exposed to topics including climate change, sustainability and environmental stewardship.

This proposal also includes the purchase of a small electric powered utility vehicle that would have a small dump bed in the back. The vehicle would be used to transport students to their cabins, maintenance activities on the campus, haul garbage and recyclables to a central location, etc. Because the nearest commercial power grid is fifteen miles away the facility must generate its own electricity from a photovoltaic system. This system meets over 80% of the electricity demands of the ranch. **The most unique part of this proposal is that the vehicle would only be plugged into a renewable energy source (photovoltaic system) to recharge.** This concept would be part of the orientation for all arriving guests and would support the purpose and mission of the Yellowstone-Teton Clean Energy Coalition and the NPS sustainability efforts. These vehicles would be treated with wraps and messaging similar to the hybrid shuttle vehicles.

NPS Interpretive Staff & Wildlife Brigade Hybrid Vehicle Upgrades

As previously mentioned, YELL and GRTE are the core of the largest intact temperate ecosystem on the planet. These two parks are home to one of the highest concentration of grizzly bears, black bears, elk, and bison in the northern hemisphere. Approximately six million visitors come to YELL and GRTE each year and drive on an estimated 600 miles of paved roads.

Bears, bison, moose, elk, and wolves are routinely observed from the road causing wildlife jams – a major traffic jam that is created when visitors stop along the road to view and photograph wildlife. If not properly managed, these jams can put humans and wildlife in dangerous proximity to each other, increasing the risk of a human-wildlife encounter and/or injury. These jams can also completely clog a road rendering it impassable. Both YELL and GRTE have rangers, interpretative staff, and volunteers

whose primary duties are to respond to wildlife jams to keep visitors and the wildlife safe.

Yellowstone
In 2009 rangers and volunteers logged over 1700 hrs managing over 600 animal jams in one small area of the park (Tower Junction). Park-wide, the numbers of hours logged by rangers is conservatively estimated at over 5,000 hrs per summer season.

Grand Teton
Between 2005 and 2006, GRTE experienced nearly a doubling of bear incidents (food rewards and/or property damage) in campgrounds and a 10-fold increase in roadside wildlife jams involving large animals. Both years were well above previous 5-year averages and these incidents represented an increased risk of both human injury and wildlife mortality at the human-wildlife interface. In response, GRTE resource managers initiated a new "Be Bear Aware" campaign in 2007, which included the development of the *Wildlife Brigade*, a corps of paid and volunteer staff whose primary duties are to respond to wildlife jams and enforce food storage at campgrounds, picnic areas, and other developed areas.

For 4 months during the summer season, the Wildlife Brigade responds to wildlife jams and patrols all park campgrounds, picnic areas, parking lots, and developed areas. To successfully achieve work goals, Wildlife Brigade members must drive approximately 100 miles per day per vehicle, or 61,000 miles a season, to educate and protect park visitors and park resources. In 2009, GRTE recorded a minimum of 611 wildlife jams and wrote 1,334 food storage violation warnings. The 2010 season is in full swing and GRTE is on track to manage the same number of jams, if not more, as in 2009.

GRTE received a small two-year grant from the competitive NPS Natural Resource Protection Project in 2007 (PMIS 129997) to help build the Wildlife Brigade program to what it is today. The current Wildlife Brigade program is comprised of 3 paid staff, 5 volunteers, and 3 interns. The program requires a minimum of 5 vehicles to successfully perform the necessary duties. Base funding is not adequate to meet the vehicle needs, among other things, and the Natural Resource Protection Project competitive grant expires at the conclusion of the 2010 fiscal year. No other sources have been identified to fund the Wildlife Brigade vehicles, which leaves the future of this very successful program in jeopardy.

Yellowstone and Grand Teton
Appropriately "wrapped" hybrid vehicles assigned to park staff that manage wildlife jams, patrol campgrounds, picnic areas, and developed areas would be exposed to tens

of thousands of visitors over the course of a summer season. The wrap would recognize the Parks' commitment to promote clean vehicle technology. By utilizing hybrid vehicles in animal jams for both Yellowstone and Grand Teton National Parks, the following will result:

- A significant reduction of green house gas (GHG) emissions. The current fleet of hybrids in greater Yellowstone area has resulted in a reduction of 68 metric tons of CO2 equivalent, annually (source: Georgia Tech Research Institute).
- Visitors have a unique opportunity to understand and learn more about hybrid technology. To date, the existing wrapped vehicles have experienced thousands of visitor contacts. Since 2004, all visitor comments have been recorded and documented. These comments are available upon request.

Both parks have had hybrids as part of their fleets since 2004. Yellowstone and Grand Teton fleet personnel are well versed on the operation and maintenance of hybrid vehicles. The vehicles will be utilized year round; hence there is no requirement for any type of vehicle storage facility.

This use of funds would address both Parks' immediate fleet maintenance needs by replacing GSA leased vehicles with the more efficient, advanced vehicle technologies; therefore, reducing overall fuel costs. The proposal is for the purchase of seven Ford Escape hybrid-electric vehicles, two for Yellowstone and five for Grand Teton National Parks. The use and exposure of these vehicles would be further maximized in both parks through their use by interpretative staff conducting programs or making informal visitor contact in high-traffic visitor areas.

Greater Yellowstone Ecosystem Idle Reduction Project

This proposal also includes a request for funding to support a new idle reduction initiative within the GYE. The objective of the GYE Idle Reduction Project is to eliminate all unnecessary engine and vehicle idling by employees and visitors. This objective will be supported through a collaborative effort by 10 Federal Land Management units in the Greater Yellowstone Coordinating Committee (GYCC).[1] The DOE's Clean Cities program will support the GYCC units by providing technical assistance and the funding requested in this proposal.

The project will consist of three focus areas – education & outreach, policy formation, and technology introduction. Taken together, each of these areas will help to meet the goals of reducing fuel consumption, improving employee and visitor awareness,

[1] Greater Yellowstone Coordinating Committee is made up of the superintendents, rangers, and managers, of Yellowstone and Grand Teton National Parks, six national forests, and two wildlife refuges in the Greater Yellowstone Ecosystem.

improving local air quality, and facilitating behavior change throughout the GYE. This project will directly affect the behavior of thousands of federal employees and has enormous outreach potential for over 7 million annual visitors to the GYE.

Representatives from GRTE, YELL, and the Yellowstone-Teton Clean Energy Coalition have agreed to participate in the project planning team. This team will be responsible for fulfilling the following deliverables, as well as communicating ongoing efforts to all other units within the GYE.

- Create a GYE idle reduction slogan to be used on outreach and education materials
- Identify education & outreach pathways including literature, online education, vehicle stickers, and signs
- Integrate idle reduction education into staff training courses
- Introduce idle reduction technologies into fleets in ten (10) law enforcement and utility vehicles. Idle reduction technologies that will be pursued can be found at http://www.independencepackage.com/ (these products are on the GSA Schedule). A case study is available that demonstrates an annual savings per unit is a minimum of $3,000 (greater depending on fuel cost). Each unit has an ROI of less than 2 years and a net savings of $9,000-$15,000, since the units have warranty of 5 years.

Project Costs

Lamar-Buffalo Ranch Hybrid Transit & Plug-in Utility Vehicle Project
Estimated cost of hybrid transit vehicles: **$XXXX**
Estimated cost of plug-in utility vehicle: **$XXXX**
Estimated cost of electric charging station: **$XXXX**
Estimate cost of hybrid shuttles and utility vehicle exterior wrapping: **$XXXX**

NPS Interpretive Staff & Wildlife Brigade Hybrid Vehicle Upgrades
Cost of the vehicles: **$XXXX** [2]
Wrapping: **$XXXX**

Greater Yellowstone Ecosystem Idle Reduction Project
Estimated cost of education and outreach materials: **$XXXX**
Estimated cost of idle reduction vehicle technologies: **$XXXX**

***Total requested funding: **$XXXX**

[2] Based on 2010 GSA pricing for 5 Ford Escapes- Thayne O'Brien, GRTE Contracting Officer.